

# **TRANSLATING NEW AGRICULTURAL PRODUCTS AND USES INTO RURAL ECONOMIC VIABILITY**

## **Overview**

- **Significance of biobased industrial products**
- **Funding authority**
- **“Demonstration and Implementation of a Modular Crop-Based Grease Production System”**
- **“Technology Development, Transfer, and Marketing of Industrial Products for Rural Communities”**
- **Summary**

# SIGNIFICANCE OF BIOBASED INDUSTRIAL PRODUCTS

**Definition** - *nonfood, nonfeed industrial products derived from domestic agricultural and forestry raw materials and wastes*

## From a Customer Perspective:

- performance
- Federal agencies promoting environmental stewardship through procurements

# SIGNIFICANCE OF BIOBASED INDUSTRIAL PRODUCTS

## From a USDA Perspective

- new business opportunities
- economic development in rural areas through new farming and processing opportunities
- value-added products from new uses and utilization of wastes
- diversification in agriculture with specialty crops and new crops
- sustainable development
- stimulation of R&D to meet the growing demand for new products and technologies

## From a national perspective

- reliable supply of industrial products for defense, industry and the consumer based on renewable, critical raw materials supplied by the American farmer.

# LEGISLATIVE AUTHORITY

***Section 401 of the Agricultural Research, Extension and Education Reform Act of 1998 (AREERA)(7 U.S.C. 7621)***

## **Initiative for Future Agriculture and Food Systems**

- integration of research, education and extension
- multidisciplinary, multi-institutional, multi-state
- education
- international collaboration

# LEGISLATIVE AUTHORITY

## **Program area 13.0 New and alternative uses and production of agricultural commodities and products**

- **new crop varieties**
- **processing biomass**
- **product development**
- **test and evaluation/certification for commercial use**
- **demonstration of processing and/or product use**
- **life cycle costing**
- **environmental attributes**
- **marketing**

# DEMONSTRATION AND IMPLEMENTATION OF A MODULAR CROP-BASED GREASE PRODUCTION SYSTEM

University of Northern Iowa, Ag-Based Industrial  
Lubricants Research Program

**Objective:** to develop a replicable, low risk grease production module tailored to the features of vegetable-based lubricants, and to establish relationships between local supply and demand through small scale, specialized production

# DEMONSTRATION AND IMPLEMENTATION OF A MODULAR CROP-BASED GREASE PRODUCTION SYSTEM

**Products are superior to petroleum-based products**

- better lubricity
- less toxic
- longer performance life

# DEMONSTRATION AND IMPLEMENTATION OF A MODULAR CROP-BASED GREASE PRODUCTION SYSTEM

## **Integrated Activities of All Stakeholders**

- seed producers
- farmers
- equipment manufacturers
- elevators
- additives suppliers
- marketers
- end users



# DEMONSTRATION AND IMPLEMENTATION OF A MODULAR CROP-BASED GREASE PRODUCTION SYSTEM

## **The Process**

- hammermill; extruder/expeller; separator
- kettle; shearing; additive packages

## **Products**

- fifth wheel grease for hitches on tractor trailers
- rail road track grease/rail curve grease

# DEMONSTRATION AND IMPLEMENTATION OF A MODULAR CROP-BASED GREASE PRODUCTION SYSTEM

## Results to Date

- Three participating farms
- small: 220 gallon kettle
- mid-sized: 300 gallon kettle
- large: 300 gallon and 850 gallon kettles
- Total grease production: 2.5 million pounds operating at full capacity for one year

On-going testing with railroad industry and trucking industries

# TECHNOLOGY DEVELOPMENT, TRANSFER, AND MARKETING OF INDUSTRIAL PRODUCTS FOR RURAL COMMUNITIES

Purdue, Department of Agricultural and  
Biological Engineering

**Objective:** to develop value-added industrial products from soybeans by combining existing small scale expeller processing equipment capacity with known soybean utilization technologies

# TECHNOLOGY DEVELOPMENT, TRANSFER, AND MARKETING OF INDUSTRIAL PRODUCTS FOR RURAL COMMUNITIES

## Partnerships

- industrial equipment manufacturers
- communities
- marketers
- consumers

## Process

- builds on existing small scale expeller processing facilities for niche food markets

# TECHNOLOGY DEVELOPMENT, TRANSFER, AND MARKETING OF INDUSTRIAL PRODUCTS FOR RURAL COMMUNITIES

## Products

- blended heating oil
- aviation deicer
- urethane foam
- solvents and glycerol
- scalable low cost esterification process
- processing study to match crop properties and process operations
- economic, marketing and rural community analysis

## Results

- new project but if successful, could potentially serve as a model for integrating biological and engineering sciences with the social sciences for optimal community benefits

# SUMMARY

- TECHNOLOGY TRANSFER
- NEW MARKETING NETWORKS
- EDUCATION
- ? PUBLIC ACCEPTANCE OF GM CROPS FOR NONFOOD USES
- INCREASED PROFITABILITY FOR FARM AND RURAL BUSINESS SECTORS